

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application

1-12 (Canceled)

13. (New) A circuit arrangement for protecting from overheating a heating element whose resistance value is a function of its temperature, the circuit arrangement comprising:
- a switch means;
 - a power supply coupled to the heating element for supplying a current to the heating element by means of the switch means;
 - a switch control circuit with an output for controlling the switch means such that the switch means is switched to a conducting state when the switch control circuit is in a first state and the switch means is switched to a non-conducting state when the switch control circuit is in a second state;
 - a current sensor means coupled to the heating element, the output of the current sensor providing a signal proportional to the current flowing through the heating element;
 - a first scaling means whose output provides a signal proportional to the supply voltage of the heating element;
 - a first detector means having inputs each coupled to an output of a respective one of the current sensor means and the first scaling means, the first detector means having an output that provides a difference signal formed from the signals of the current sensor means and the scaling means; and
 - an evaluation circuit operable to compare the difference signal determined by the first detector means with a reference signal, the switch control circuit being operatively connected to the evaluation circuit such that the switch control circuit can be switched from the first state into the second state by the evaluation circuit.

14. (New) The circuit arrangement according to claim 13, wherein the current sensor means and the first scaling means are configured such that the signals which can be tapped at their output have the same magnitude at the nominal resistance of the heating element.
15. (New) The circuit arrangement according to claim 13 wherein a difference voltage can be detected by the first detector means only in the event of a change in the resistance of the heating means.
16. (New) The circuit arrangement according to claim 13, wherein the evaluation circuit comprises a second detector means with two inputs and one output, wherein the output signal of the first detector means can be supplied to one input and the reference signal can be supplied to the other input, and wherein the output forms the output of the evaluation circuit.
17. (New) The circuit arrangement according to claim 13, wherein the evaluation circuit has a second scaling means which is used to set the reference signal.
18. (New) The circuit arrangement according to claim 17, wherein the second scaling means is coupled to the supply voltage acting upon the heating element to derive the reference signal from the supply voltage.
19. (New) The circuit arrangement according to claim 16, wherein the output of the second detector means is fed back to the input.
20. (New) The circuit arrangement according to claim 13, wherein the power supply of the heating element is an AC voltage, and a rectifier arrangement and a smoothing circuit are connected between the first and the second detector means.

21. (New) The circuit arrangement according to claim 13, wherein the switch means is a relay that becomes operative in the first state of the switch control circuit when the heating element is operating correctly.
22. (New) The circuit arrangement according to claim 13, wherein the heating element is an electrical resistance heater, especially made from thick film paste, with PTC behavior where the resistance increases with increasing temperature.
23. (New) A heating device for fluids, the heating device comprising:
 - a heating element; and
 - a circuit arrangement for protecting from overheating a heating element whose resistance value is a function of its temperature, the circuit arrangement comprising:
 - a switch means;
 - a power supply coupled to the heating element for supplying a current to the heating element by means of the switch means;
 - a switch control circuit with an output for controlling the switch means such that the switch means is switched to a conducting state when the switch control circuit is in a first state and the switch means is switched to a non-conducting state when the switch control circuit is in a second state;
 - a current sensor means coupled to the heating element, the output of the current sensor providing a signal proportional to the current flowing through the heating element;
 - a first scaling means whose output provides a signal proportional to the supply voltage of the heating element;
 - a first detector means having inputs each coupled to an output of a respective one of the current sensor means and the first scaling means, the first detector means having an output that provides a difference signal formed from the signals of the current sensor means and the scaling means; and

an evaluation circuit operable to compare the difference signal determined by the first detector means with a reference signal, the switch control circuit being operatively connected to the evaluation circuit such that the switch control circuit can be switched from the first state into the second state by the evaluation circuit.

24. (New) A method for the fused protection from damage of a heating device for fluids, the heating device including a heating element and the heating device having a resistance value that is a function of its temperature, the method comprising:
- detecting change in the resistance; and
 - comparing the detected change in the resistance with a reference signal and selectively interrupting the heating circuit by means of a switch means in dependence upon the comparison of the detected change in the resistance with a reference signal.